UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Oceanic and Atmospheric Research
Pacific Marine Environmental Laboratory
7600 Sand Point Way NE
Seattle, WA 98115

FINAL Project Instructions

Date Submitted:	July 12, 2012
Platform:	NOAA Ship *Ronald H. Brown*
Project Number:	RB-12-04
Project Title:	Western Atlantic Climate Study (WACS)
Project Dates:	August 19, 2012, to August 27, 2012

Prepared by: Trish Quinn Dated: July 12, 2012
Trish Quinn
Chief Scientist
NOAA PMEL

Approved by: Chris Sabine Dated: July 12, 2012
Chris Sabine
Director
NOAA PMEL

Approved by: ____________________ Dated: ________________
Captain Anita L. Lopez, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. NOAA Ship *Ronald H. Brown* will participate in multiple deployments and recoveries of an in situ sea spray particle generator, Sea Sweep, for characterization of properties and cloud-nucleating ability of nascent ocean-derived aerosol. In addition, atmospheric particles and gases and surface seawater will be sampled to assess the impact of ocean emissions on atmospheric composition.

B. Service Level Agreements

Of the 9 DAS scheduled for this project, 0 DAS are funded by OMAO and 9 DAS are funded by Charter Funds. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

WACS operating area is the western North Atlantic within the region bounded by approximately 31° to 43°N and 64° to 70°W. See Appendix 1 for a map of the project working area.

D. Summary of Objectives

1. Characterization of freshly emitted ocean-derived sea spray aerosol particles. Ocean-derived particles can impact the Earth's radiation budget by altering cloud properties including albedo (reflectivity), lifetime, and extent and by scattering solar radiation. Characterization of the properties of these particles in their freshly emitted state is needed for accurate model calculations of their impact on climate. Properties of the particles to be characterized include chemical composition, size distribution, number concentration, cloud-nucleating ability, light scattering as a function of relative humidity, and light absorption. To assess how ocean biogeochemistry impacts sea spray particles, measurements will be made in both high and low productivity waters and relevant surface seawater parameters will be measured in situ. Freshly emitted sea spray particles will be generated in two different ways with an emphasis on preventing contamination from existing atmospheric particles and gases. First, NOAA Pacific Marine Environmental Laboratory (PMEL)'s Sea Sweep particle generator will be deployed over the port side of the ship next to the bow. Aerosol particles will be drawn from the Sea Sweep into the aerosol inlet located on top of AeroPhys van on the O2 deck. Aerosol will then be distributed to instruments in AeroPhys, AeroChem, Guest, and Russell vans. Second, uncontaminated seawater will be fed to an aerosol generator in the University of Virginia van located on the O2 deck. Aerosol will be drawn from the generator and sampled by instruments in the University of Virginia van and the Russell van.

2. Characterization of ocean-derived gas phase precursors that result in the formation and processing of atmospheric aerosol particles. Sensors will be deployed on the O2 deck forward on top of AeroPhys van and on the O3 deck forward rail.

3. Characterization of surface ocean organic material to assess its influence on ocean-derived sea spray aerosol particles. This work will involve 3 aspects:

a. Continuous measurement of uncontaminated seawater. Uncontaminated seawater will be fed continuously to i) Seawater van on the main deck and analyzed for fluorescence, particulate organic carbon (POC), and dimethylsulfide (DMS) and ii) Hydro Lab for the CO2 equilibrator.

b. Discrete collection of uncontaminated seawater. Uncontaminated seawater will be collected into a 100 L carboy and concentrated for determination of microbial diversity and bio-turnover rates of volatile organic compounds (VOCs). This collection of seawater and cell concentrations will take place in the Wet Lab.

c. Incubation of plankton with 14C isotopically labeled VOCs to measure VOCs bio-turnover rates. Incubations and incorporation of 14C will be conducted only in the Bio/Analytical Lab. Baseline incubations that do not involve 14C will be conducted in Guest Van.

E. Participating Institutions

NOAA PMEL, NOAA Earth System Research Laboratory (ESRL), Scripps Institute of Oceanography (SIO), University of Colorado, University of Helsinki, Oregon State University (OSU), University of Stockholm, University of Virginia, Hiram College, State University of New York (SUNY), Naval Academy, Hokkaido University, Harvard University, University of Uppsala, and Institute of Atmospheric Sciences and Climate (ISAC).

F. Personnel/Science Party

Name (Last, First)	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation**	**Nationality**
Bates, Tim	8/18/12	8/28/12	M	NOAA PMEL	USA
Coffman, Derek	8/18/12	8/28/12	M	NOAA PMEL	USA
Commane, Roisin	8/18/12	8/28/12	F	Harvard	Ireland (J1 Visa)
Frossard, Amanda	8/18/12	8/28/12	F	SIO	USA
Gonzalez, Laura	8/18/12	8/28/12	F	Univ. of Colorado	USA
Graus, Martin	8/18/12	8/28/12	M	NOAA ESRL	Austria
Guzman-Morales, Janin	8/18/12	8/28/12	F	SIO	Mexico
Hakala, Jani	8/18/12	8/28/12	M	Univ. of Helsinki	Finland
Halsey, Kim	8/18/12	8/28/12	F	OSU	USA

Hamacher-Barth, Evelyne	8/18/12	8/28/12	F	Univ. of Stockholm	Sweden
Hamilton, Drew	8/18/12	8/28/12	M	NOAA PMEL	USA
Haserodt, Megan	8/18/12	8/28/12	F	NOAA PMEL	USA
Henderson, Gina (Teacher at Sea)	8/18/12	8/28/12	F	Naval Academy	Irish w/green card
Izaguirre, Miguel	8/18/12	8/28/12	M	RSMAS	USA
Johnson, Jim	8/18/12	8/28/12	M	NOAA PMEL	USA
Keene, Bill	8/18/12	8/28/12	M	Univ. of Virginia	USA
Kercher, Jim	8/18/12	8/28/12	M	Hiram College	USA
Kieber, Dave	8/18/12	8/28/12	M	SUNY	USA
Kinsey, Joanna	8/18/12	8/28/12	F	SUNY	USA
Long, Micheal	8/18/12	8/28/12	M	Harvard	USA
Maben, John	8/18/12	8/28/12	M	Univ. of Virginia	USA
Martensson, Monica	8/18/12	8/28/12	F	Univ. of Uppsala	Sweden
Novak, William	8/18/12	8/28/12	M	Hiram College	USA
Quinn, Trish	8/18/12	8/28/12	F	NOAA PMEL	USA
Russell, Lynn	8/18/12	8/28/12	F	SIO	USA
Schulz, Kristen	8/18/12	8/28/12	F	NOAA PMEL	USA
Thrash, Cameron	8/18/12	8/28/12	M	OSU	USA
Tyssebotn, Inger	8/18/12	8/28/12	F	SUNY	Sweden

G. Administrative

1. Points of Contacts:

Chief Scientist:
Trish Quinn
NOAA PMEL
7600 Sand Point Way NE
Seattle, WA 98115
(206) 526-6892 (voice), (206) 526-6774 (fax), 425-320-8517 (cell)
patricia.k.quinn@noaa.gov

Ops Officer:
LT Paul Chamberlain
NOAA Ship *Ronald H. Brown*

Marine Operations Center, Atlantic
439 West York Street
Norfolk, VA 23510-1145
(843) 693-2082 (cell), (757) 299-8455 (e-fax)
OPS.Ronald.Brown@noaa.gov

2. Diplomatic Clearances

This project involves Marine Scientific Research in waters under the jurisdiction of Canada and Bermuda. Diplomatic clearance has been requested. Consent was received from Canada on 12 April 2012. As of 29 June 2012 we are waiting to hear from Bermuda.

3. Licenses and Permits

N/A

II. Operations

A. Project Itinerary

Start	Stop	Operation
August 19	August 20	Transit to first work area in the vicinity of 42.3°N and 64.8°W. Atmospheric and surface seawater sampling en route.
August 20	August 22	Sample at first station. Day and night deployments of Sea Sweep. Atmospheric and surface seawater sampling.
August 22	August 24	Transit to second work area near 34°N and 64.8°W. Atmospheric and surface seawater sampling en route.
August 24	August 26	Sample at second station. Day and night deployments of Sea Sweep. Atmospheric and surface seawater sampling.
August 27		Arrive St. George’s, Bermuda

B. Staging and Destaging

Staging: Loading and preparation of scientific equipment for this project will take place in Boston between August 13 and 18, 2012. Eight vans will be loaded on the ship with a shore crane on August 13. In addition, the shore crane will install aerosol sampling masts (20’ high) on top of AeroPhys and Russell vans and will lift the radon instrument and smaller pieces of equipment to the O2 and O3 decks forward. See Appendix 2 for a diagram of the van placement on the ship and Appendix 3 for a table of van weights, power requirements, and additional requirements.

It is the responsibility of the scientists to arrange for shipment of their equipment and vans to *Ronald H. Brown*. The project will arrange for the shore crane.

Destaging: On August 28, three vans (to be determined) will be offloaded in Bermuda with the use of a shore crane. Two vans will be stacked on top of Alvan and Storage van on the O1 deck port side. Five vans will remain on the ship with one 20’ van on the O2 deck forward and four 20’ vans on the O1 deck port side. Sea Sweep will be deflated and stored in Storage van. The remaining five vans will be offloaded in Charleston between October 28 and 30, 2012.

It is the responsibility of the scientists to arrange for shipment of their equipment and vans from *Ronald H. Brown*. The project will arrange for the shore crane in Bermuda and in Charleston.

C. Operations to be Conducted

a. **Atmospheric sampling**. Atmospheric sampling will be conducted continuously while the ship is in transit between Sea Sweep working areas (see Appendix 1 for a map of working areas). A list of atmospheric measurements is provided in Appendix 4. Atmospheric samples will be drawn into 20’ high inlets mounted on top of the AeroPhys and Russell vans. Samples will be distributed from the two inlets to instruments in AeroPhys, AeroChem, Guest, and Russell vans. In addition, a Hi Volume particulate sampler and radon instrument will be secured to be O3 deck railing for collection of aerosol.

b. **Continuous surface seawater sampling**. Surface seawater from the uncontaminated seawater line will be sampled continuously while the ship is in transit and during deployment of Sea Sweep. A list of surface seawater measurements is provided in Appendix 5. A portion of the flow from the uncontaminated seawater line will be fed to Seawater van (~5 L/min) and to an equilibrator in the Hydro Lab for pCO2 measurements (6 L/min).

c. **Discrete collection and analysis of surface seawater.** Uncontaminated seawater will be collected sporadically into a 100 L carboy for cell concentration in the Wet Lab. Baseline incubations of plankton from the concentrated cells will take place in Guest Van to determine background concentrations of VOCs. Incubations of plankton with incorporation of 14C labeled VOCs will be conducted in the Bio/Analytical lab to assess bio-turnover rates of VOCs.

d. **Collection and analysis of 500 m and 2500 m seawater.** Several 500 m casts and one to two 2500 m casts will be conducted in Working Areas 1 and 2 (Appendix 1) using the AOML CTD package (24 12 L bottles and CTD sensor). Water will only be collected at depths of 500 and 2500 m. Water will be analyzed by the same methods that will be used for surface seawater (Appendix 5).

e. **Sea Sweep Sampling.** Sampling of nascent sea spray particles from Sea Sweep will be conducted while the ship is on station in Working Areas 1 and 2 (see Appendix 1 for location of working areas). A list of Sea Sweep measurements is provided in Appendix 6. Between deployments, Sea Sweep will be stored on the port side of the

Main Deck aft. The deck crane will be required to deploy Sea Sweep over the port side. Sea Sweep is tethered to the ship during sampling. Sampling hoses are connected between Sea Sweep and the aerosol inlet on top of AeroPhys van. See Appendix 7 for photos of Sea Sweep deployment and sampling.

f. **Sea Spray Bubble Generator Sampling.** Sampling of nascent sea spray particles from the Univ. of Virginia bubble generator will be conducted intermittently while the ship is in transit and while in Working Areas 1 and 2. A list of the bubble generator measurements is provided in Appendix 6. The bubble generator requires a flow of uncontaminated seawater of 10 L/min. A tube will be snaked from the uncontaminated seawater line in the Main Lab, into through puts up to the O2 deck to supply the Univ. of Virginia van.

D. Dive Plan

N/A

E. Applicable Restrictions

Conditions which preclude normal Sea Sweep operations include poor weather, equipment failure, safety concerns, and unforeseen circumstances. Atmospheric and surface seawater sampling can continue in poor weather conditions unless access to vans becomes a safety issue.

III. Equipment

A. Equipment and Capabilities provided by the ship

The following systems and their associated support services are essential to the cruise. Sufficient consumables, back-up units, and on-site spare parts and technical support must be in place to assure that operational interruptions are minimal. All measurement instruments are expected to have current calibrations and all pertinent calibration information shall be included in the data package.

a. Navigational systems including high resolution GPS.

b. Thermosalinograph calibrated to within 0.1°C and 0.01 ppt.

c. Dry compressed air (120 psi, 4 CFM) to the O2 deck. Power, fresh water, telephone and Ethernet connections to vans (see Appendix 3).

d. Continuously flowing uncontaminated seawater to the CO2 equilibrator in the Hydro Lab (6 L/min), instruments in Seawater van (5 L/min), and the bubble generator in the University of Virginia van (10 L/min). A flow of uncontaminated seawater in the Wet Lab for sporadic collection of volumes up to 100 L.

e. Laboratory/work space.

f. Refrigerator space (10 cubic feet) for air and seawater samples (no chemicals).

g. Freezer space (10 cubic feet) for air and seawater samples (no chemicals).

h. Hood for use of solvents.

i. Realtime TCP/IP or RS-232 feed of ship data for the PMEL data logger system. These data include: true wind direction and wind speed, gyro compass heading, latitude, longtitude, air temperature and relative humidity, salinity, sea surface temperature from the Thermosal, and fluorescence from the ship's fluorometer.

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B. Equipment and Capabilities provided by the scientists

a. Measured weights from a truck scale or similar will be provided for all science vans. It is understood that vans without current measured weights will not be accepted onboard. These weights can be found in Appendix 3.

b. Chemical reagents, compressed gases, and liquid nitrogen. A complete listing of all chemicals to be brought onboard is included in the Hazardous Materials section. Material Data Safety Sheets will be provided to the ship before any chemicals are loaded. Tanks will be secured vertically in tank racks. Hydrostatic test dates on gas cylinders will follow DOT regulations.

c. Other consumables, i.e., pens, pencils, paper, data storage media, etc.

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- A list of neutralizing agents, buffers, and/or absorbents required for these hazardous materials, if they are spilled
- A chemical hygiene plan.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory of hazardous material indicating all materials have been used or removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific Parties are expected to muster as per the ship's SPILL RESPONSE STATION BILL and then report to ON-SCENE with MSDS to assist. Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of scientific chemicals is not permitted during projects aboard NOAA ships.

B. Radioactive Isotopes

The Chief Scientist is responsible for complying with OMAO 0701-10 Radioactive Material aboard NOAA Ships. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

At least three months in advance of a domestic project and eight months in advance of a foreign project start date the shall submit required documentation to MOC-CO, including:

1. NOAA Form 57-07-02, Request to Use Radioactive Material aboard a NOAA Ship
2. Draft Project Instructions
3. Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or a state license for each state the ship will operate in with RAM on board the ship.
4. Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241), if only state license(s) are submitted).
5. MSDS
6. Experiment or usage protocols, including spill cleanup procedures.

Scientific parties will follow responsibilities as outlined in the procedure, including requirements for storage and use, routine wipe tests, signage, and material disposal as outline in OMAO 0701-10.

All radioisotope work will be conducted by NRC or State licensed investigators only, and copies of these licenses shall be provided per OMAO 0701-10 at least three months prior to the start date of domestic projects and eight months in advance of foreign project start dates.

C. Inventory (itemized)

Common Name	Concentration	Amount	Neutralizer	Notes - van
Acetone		4 L	Dry lime, sand, soda ash	Alvan
Acetonitrile		16 L	Dry lime, sand, soda ash	Alvan
Ammonium Nitrate		500 g	Dry lime or soda ash	AeroChem
Ammonium Sulfate		500 g	Sweep up	AeroChem
Ascarite (NaOH)		500 g	Sweep up	Alvan
Breathing air		2 tanks	none	AeroChem
Butanol		20L	Vermiculite or sand	Alvan
Calcium sulfate (drierite)		5 kg	Sweep up	Alvan
CH4	5% balance He	2 tanks	Evacuate	AeroChem
Charcoal		2 kg	Sweep up	Univ. VA
CO2		2 tanks	Evacuate	AeroPhys
Formaldehyde	10%	25 ml	Vermiculite or sand	Guest
Glycerol		500 ml	Vermiculite or sand	Alvan
Hexane		3 L	Vermiculite or sand	Alvan
Hydrochloric acid		1L	Sodium carbonate	Alvan
Hydrogen peroxide	10%	500 ml	Vermiculite or sand	Alvan
Isopropyl alcohol		1L	Vermiculite or sand	Seawater
Liquid N2			Evacuate	O2 deck
Liquinox		250 ml		Univ. VA
Lithium chloride		500 g	Sweep up	Alvan
Lithium fluoride		500 g	Vermiculite or sand	Alvan
Methanol		9L	Dry lime, sand, soda ash	Univ. VA, Alvan
N2		5 tanks	Evacuate	Guest
Nitric acid	2N	2 L	Vermiculite or sand	Alvan
O2	10% balance He	2 tanks	Evacuate	AeroChem
Phosphoric acid	80%	500 ml	Sodium carbonate	Alvan
Phosporus acid		100 g	Sodium carbonate	Alvan
Potassium hydrogen phthalate (KHP)		100 g	Sweep up	Seawater
Potassium nitrate		100 g	Vacuum	Seawater

Silica gel		1 kg	Sweep up	Alvan
Sodium bicarbonate		500 g	Sweep or vacuum	Alvan
Sodium carbonate		500 g	Sweep or vacuum	Alvan
Sodium chloride		500 g	Sweep or vacuum	AeroChem
Sodium hydroxide	20% w/w	250 ml	Acetic, hydrochloric, or sulfuric acids	Seawater
Sucrose		500 g	Sweep up	AeroChem
Sulfuric Acid	18M	2L	Soda ash or lime	Alvan
Trichloroacetic acid		250 ml	Sodium carbonate	Guest
UHP H2		2 tanks	Evacuate	AeroChem
UHP He		2 tanks	Evacuate	AeroChem

V. Additional Projects

A. Supplementary ("Piggyback") Projects

N/A

C. NOAA Fleet Ancillary Projects

N/A

VI. Disposition of Data and Reports

A. Data Responsibilities

B. Pre and Post Project Meeting

Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of project objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed. Minutes of the post-project meeting will be distributed to all participants by email, and to the Commanding Officer and Chief of Operations, Marine Operations Center.

C. Ship Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the survey.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
E-mail MOA.Health.Services@noaa.gov

Prior to arriving aboard, the Chief Scientist must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *NMAO Fleet IT Security Policy* 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

(1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
(2) Installation of the latest critical operating system security patches.
(3) No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (http://deemedexports.noaa.gov). National Marine Fisheries Service personnel will use the Foreign National Registration System (FRNS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated NMFS Deemed Exports point of contact to assist with the process.

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

1. Provide the Commanding Officer with the e-mail generated by the FRNS granting approval for the foreign national guest's visit. This e-mail will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.
3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.
4. Export Control - Ensure that approved controls are in place for any technologies that are subject to Export Administration Regulations (EAR).

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

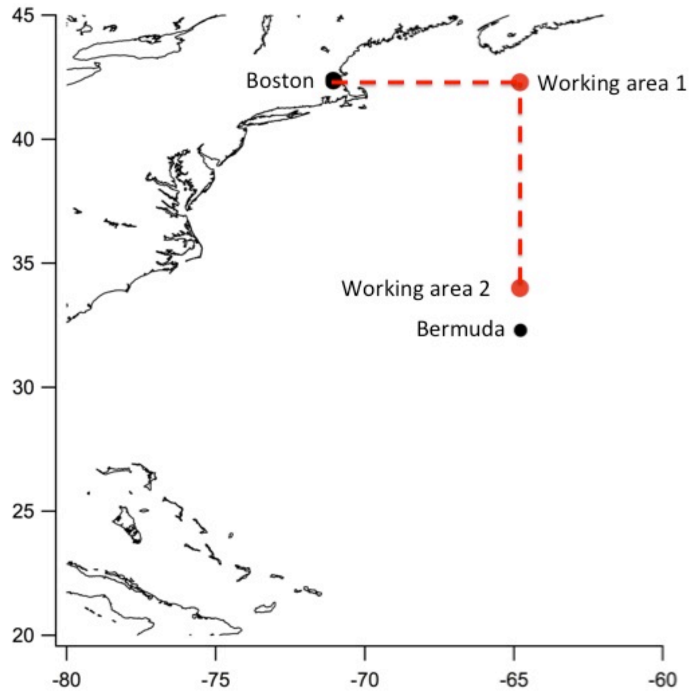
1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FRNS e-mail granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the project, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

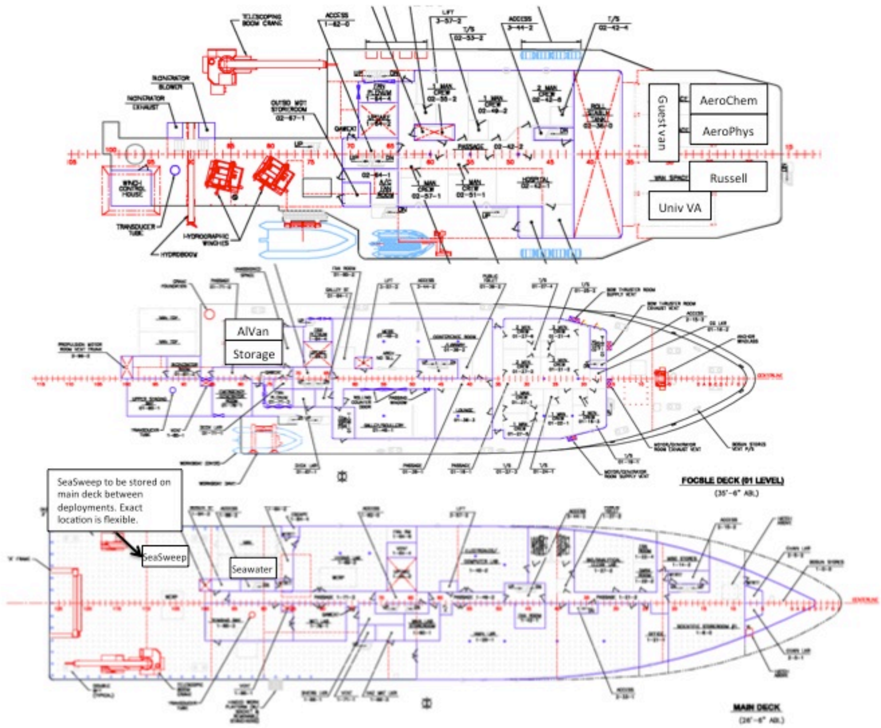
1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National

Appendices

Appendix 1. Map of project working area.



Appendix 2. Placement of vans on ship for WACS.



Appendix 3. Table of van weights and power and other requirements.

	Weight (lbs)	Size (ft)	Power	Other requirements
Main Deck				
PMEL SW van	12,000	8 x 16	480 VAC, 70 A, 3-phase	Phone, Uncontaminated seawater (~5 L/min)
O1 Deck Port Side				
PMEL Storage Van	12,000	8 x 20	110 VAC	
PMEL Alvan	12,000	8 x 20	480 VAC, 30 A, 3-phase	Phone, Fresh water, ethernet connection
Sea Sweep	1,000			crane for putting it in the water
O2 Deck Forward				
AeroChem	15,000	8 x 20	480 VAC, 70 A, 3-phase	Phone
AeroPhys	17,000	8 x 20	480 VAC, 70 A, 3-phase	Phone, dry compressed air @ 120 psi, 4 CFM
GuestVan	15,000	8 x 20	Power from AeroChem van	
Russell Van	15,000	8 x 20	480 VAC, 70 A, 3-phase	Phone, dry compressed air @ 120 psi, 4 CFM, Ethernet connection
Univ VA van	15,000	8 x 20	Power from Russell van	Uncontaminated seawater
Black tubes	1,000			
Frames	9,000			
O3 Deck Forward				
Radon Instrument	250			

Appendix 4. Table of Atmospheric Gas Phase and Aerosol Measurements.

Institution	Parameter	PI	Method
PMEL	O3	Bates	UV absorbance
PMEL	SO2	Bates	Pulsed UV fluorescence
ESRL	VOCs	de Gouw	PTR-MS
UW	CO	Quinn	NDIR
UW	N2O5, ClNO2, Cl2, Br2	Kercher	CIMS
CU	CHOCHO, HCHO, NO2, BrO, IO, O4	Volkamer	MAX-DOAS
PMEL	Radon	Johnson	Radon tank
PMEL	Met parameters	Johnson	Various
PMEL	Inorganic Ions	Quinn	Impactors - IC
PMEL	OC EC	Bates	Impactors - Thermal/optical
PMEL	NR species	Bates	Q-AMS
PMEL	Trace elements	Quinn	Impactors - XRF
PMEL	Total mass	Quinn	Impactors - Gravimetry
PMEL	Number concentration	Bates	CPC
PMEL	Size Distribution	Bates	DMPS/APS
PMEL	Volatility	Bates	Thermal denuder/TSMPS
PMEL	CCN	Quinn	DMT CCNC
PMEL	f(RH)	Quinn	CRD, dual nephs
PMEL	Scattering	Quinn	Nephelometers
PMEL	Extinction	Quinn	CRD
PMEL	Absorption	Quinn	PSAPs, PAS
SIO	NR species	Russell	HR-ToF-AMS
SIO	Organic functional groups	Russell	Filter/FTIR
SIO	Single particle organic content, size, morph	Russell	Streaker
SIO	BC mass concentrations	Russell	SP2
SIO	Number size distribution	Russell	SMPS, OPS
SIO	Number concentration	Russell	CPC
Univ Helsinki	Hygroscopic growth	Hakala	VHTDMA
SUNY	CDOM spectra	Kieber	Spectrometer
SUNY	Amino Acids	Kieber	HPLC-Fluorescence
Hokkaido Univ	Diacids, lipids, sugars, SOA tracers	Kawamura	Hi-Vol
ISAC	WSOC, WIOC, organic composition	Facchini	Impactors/1H NMR

Wendy Bradfield-Smith 7/12/12 1:38 PM
Comment [2]: Who is this? Chief of Naval Research?

Appendix 5. Table of Surface Seawater Measurements from the Uncontaminated Seawater Line.

Institution	Parameter	PI	Method
PMEL	TOC, TON	Bates	Combustion, catalytic oxidation
PMEL	chlorophyll	Bates	Fluorescence
PMEL	DMS	Johnson	Chemisluminescence
PMEL	POC	Bates	Thermal/optical
SUNY	TOC/DOC	Kieber	Combustion, catalytic oxidation
SUNY	Amino Acids	Kieber	HPLC Fluorescence
SUNY	CDOM spectra	Kieber	Specrometer
OSU	Seawater microbial diversity analyses	Halsey	Metagenomic methods
OSU	phytoplankton production rates of VOCs	Halsey	Plankton incubation with 14C labelled organic compounds
ESRL	Seawater dissolved VOCs	de Gouw	PTR-MS/equilibrator (O1 deck starboard side)
AOML	pCO2	Wanninkhof	Equilibrator (hydro lab)

Appendix 6. Table of PMEL Sea Sweep and Univ. of Virginia Bubble Generator Measurements.

Institution	Parameter	PI	Method
	Sea Sweep (PMEL)		
PMEL	Inorganic Ions	Quinn	Impactors - IC
PMEL	OC EC	Bates	Impactors - Thermal/optical
PMEL	NR species	Bates	Q-AMS
PMEL	Trace elements	Quinn	Impactors - XRF
PMEL	Total mass	Quinn	Impactors - Gravimetry
PMEL	Number concentration	Bates	CPC
PMEL	Size Distribution	Bates	DMPS/APS
PMEL	Volatility	Bates	Thermal denuder/TSMPS
PMEL	CCN	Quinn	DMT CCNC
PMEL	f(RH)	Quinn	CRD, dual nephs
PMEL	Scattering	Quinn	Nephelometers
PMEL	Extinction	Quinn	CRD
PMEL	Absorption	Quinn	PSAPs, PAS
SIO	NR species	Russell	HR-ToF-AMS
SIO	Organic functional groups	Russell	Filter/FTIR
SIO	Single particle organic content, size, morph	Russell	Streaker
SIO	BC mass concentrations	Russell	SP2
SIO	Number size distribution	Russell	SMPS, OPS
SIO	Number concentration	Russell	CPC
Univ Helsinki	Sea Sweep hygroscopic growth	Jakala	VHTDMA
SUNY	CDOM spectra	Kieber	Spectometer
SUNY	Amino Acids	Kieber	HPLC Fluorescence
Hokkaido Univ	Diacids, lipids, sugars, SOA tracers	Kawamura	Hi-Vol
CNR	WSOC, WIOC, organic composition	Facchini	Impactors/1H NMR

	Bubble Generator (Univ. of Virginia)		
SIO	Composition	Russell	Impactors
SIO	Number size distribution	Russell	DMA, APS

Appendix 7. Photos of Sea Sweep Deployment.